

REMARKS

Claims 1–19 were in the application as last examined, with claims 1–8 and 19 reinstated after withdrawal of the previous restriction. Claims 1, 6, 9, and 14 are amended, and claims 1–19 remain in the application. No new matter is added by the foregoing amendments. Applicants respectfully request further consideration and examination of claims 1–19 in accord with the following remarks.

Rejections under 35 U.S.C. §103

Claims 1–5 and 9–19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Goetzke et al. '094. The rejection is respectfully traversed.

Each of independent claims 1, 9, and 14 require the enlarged cavity to be entirely within a one-piece body, and to have a geometry representing roughly the cross section of one of the first and second passageways at any angle, and a center point at the intersection of the first and second longitudinal axes. In Goetzke et al. '094, the annular groove is not entirely within a one-piece body; rather, it is defined by the spring cage 16 and the check valve cage 19 – two distinct pieces. Moreover, the annular groove does not have a geometry representing roughly the cross section of one of the first and second passageways at any angle. As a toroid, only the geometry of its cross section represents a cross section of either passageway, and that at only one angle. Further, the center point of the annular groove is not the center of the cross section, unlike the center point of the cavity of the claims. A toroidal cavity lacks a center point inside the cavity. Even if one were to consider the center point of the annular groove to be the center point of the cross section, and if one were to extrapolate the center lines of the respective passageways, given their orientation, the lines would intersect each other away from the center point of the cross section.

In view of all of these differences between Goetzke et al. '094 and claims 1, 9, and 14, it would not have been obvious to one of ordinary skill to achieve the claimed invention. Thus, claims 1, 9, and 14 are patentable over Goetzke et al. '094. And because the remaining claims 4–

5, 10-13, and 15-19 all depend directly or indirectly from claims 1, 9, or 14, they are likewise patentable for the same reasons.

Moreover, claims 2, 10, and 15 require the enlarged cavity to be generally spherical. What the Examiner calls an enlarged cavity in Goetzke et al. '094 is an annulus, and by definition not spherical. Even if one were to consider only the cross section as representative of a non-annular cavity, it is apparent from the drawings of Goetzke et al. '094 that it would not be generally spherical.

Yet further, claims 3, 5, 13, 16, and 18 require the diameter of the enlarged cavity to be at least twice the cross sectional diameter of one of the passageways. Only if one were to consider the diameter of the annulus would the diameter be at least twice the diameter of at least one of the passageways. But such an interpretation would be internally inconsistent with other positions on the claims, and not representative of the diameter of a cavity. Looking at the cross section of the annulus in Figure 2 of Goetzke et al. '094, it is not clearly twice the diameter of the passageways, even in the longest direction.

In addition, claims 4, 12, and 17 require the angle of intersection to be about 90°. The angle of the intersection in Goetzke et al. '094 appears to be more like 135° (about half way between 90° and 180°). Even in the broadest view of the term "about" in a range of 90° to 180°, one of ordinary skill would not place 135° as being *about* 90°.

Claims 6-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rix '026 in view of Shade et al. '556. The rejection is respectfully traversed.

Rix '026 discloses nothing more than the prior art referred to in the application. It uses ECM (electrochemical machining) to provide an enlarged radius where the angle between the respective bore walls of the conduits is most acute. (Rix '056, Col. 1, ll.63-64, and Col. 2, ll. 1-21) This disclosure is essentially the same as the prior art referenced in paragraphs [0005] and [0028] of the background section of the application where it is recognized to use ECM to smooth a sharp radius at the intersection of the conduits. Rix '026 refers to a pocket 212 resulting from

the ECM, but the pocket 212 is recessed into the wall of a bore and limited in radial extent. (Rix '056, Col. 7, ll. 13-35)

Similarly, Shade et al. '556 discloses nothing more than the prior art recognized in the application. Forming the two intersecting conduits in a fuel injector body by drilling is disclosed in paragraph [005] of the background section of the application.

Neither Rix '026, nor Shade et al. '556 disclose an enlarged cavity entirely within a one-piece body, having a geometry representing roughly the cross section of the first or second passageway at any angle, and a center point at the intersection of the first and second longitudinal axes. Nothing in either reference or the art in general would lead one of ordinary skill to guide an ECM head at the intersection of two conduits to form such a cavity. Indeed the prior art suggests ECM only to smooth the radius of sharp acute angles, not to form the claimed cavity.

CONCLUSION

Prompt notification of allowability is respectfully requested. If there are any remaining issues which the Examiner believes may be resolved in an interview, the Examiner is respectfully invited to contact the undersigned.

Respectfully submitted,

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